REPORT ON INSTALLATION OF OBSERVATION WELLS WCC-11S AND WCC-12S AT DOUGLAS AIRCRAFT COMPANY'S FACILITY IN TORRANCE, CALIFORNIA

Prepared for:

Douglas Aircraft Company
4900 Airport Plaza Drive
Long Beach, California

Prepared by:

Woodward-Clyde Consultants
2020 East First Street, Suite 400
Santa Ana, California 92705

Project No. 8941863J
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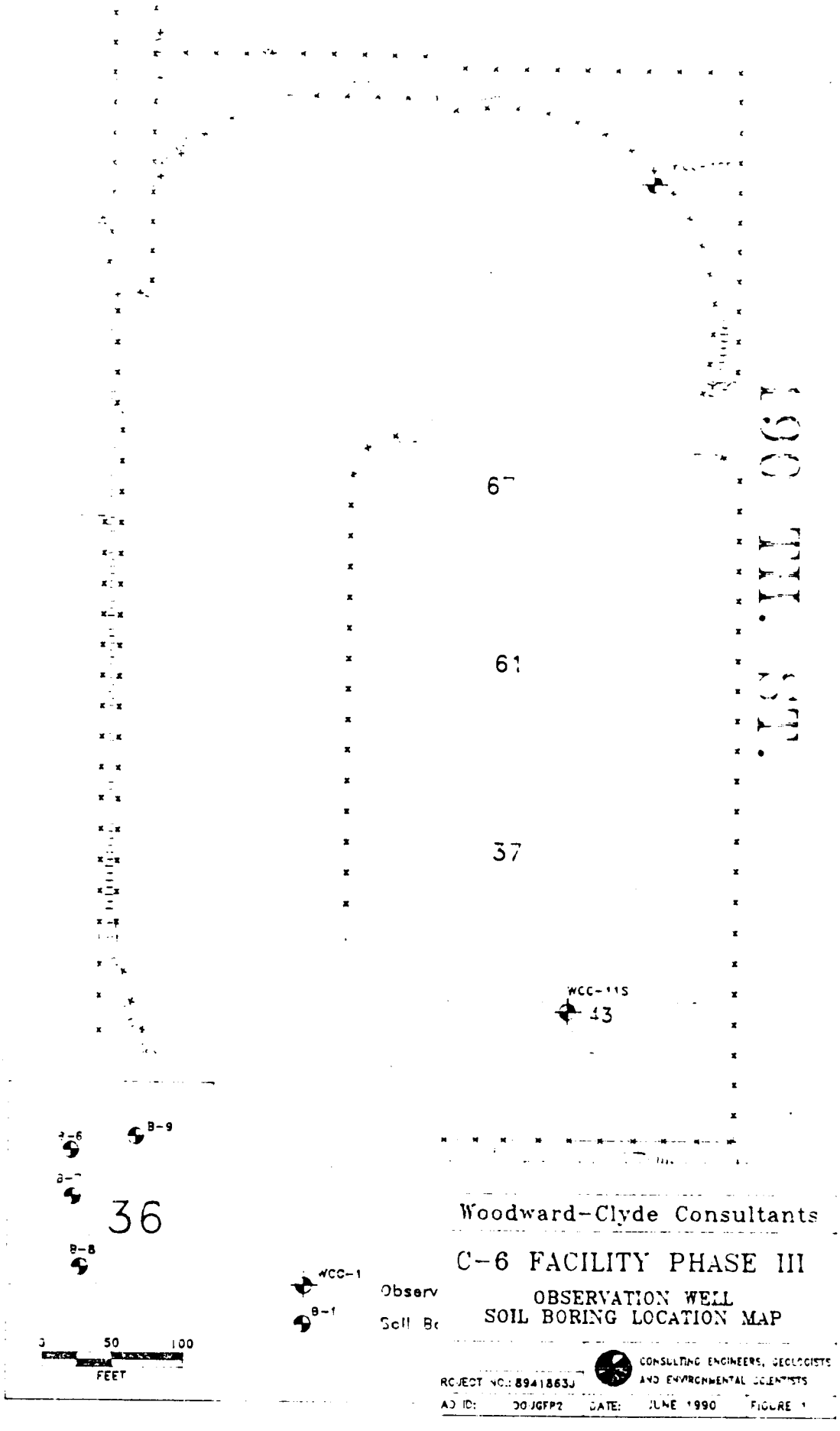
1.0
INTRODUCTION

As part of the soil and groundwater monitoring investigation at Douglas Aircraft Company's Torrance (C-6) facility located at 19503 S. Normandie Avenue, Los Angeles, California, Woodward-Clyde Consultants (Woodward-Clyde) installed two additional observation wells (WCC-11S and WCC-12S) at the facility. These wells were installed to help delineate the extent of organic compounds in the groundwater, in the vicinity of Tanks 15T to 18T at this facility. Locations of observation wells WCC-11S and WCC-12S (along with the locations of existing observation wells) are shown on Figure 1. The wells were developed and sampled, and the analytical results obtained from sampling the wells are also presented in this report.



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C-6 FACILITY PHASE III

OBSERVATION WELL
SOIL BORING LOCATION MAP

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

PROJECT NO.: 8941863J

AD ID: 30JGFP2 DATE: JUNE 1990 FIGURE 1

3.0
LABORATORY RESULTS

Soil samples collected from the observation well borings at the water table were analyzed for volatile organic compounds (VOCs) by EPA Method 8240. Groundwater samples collected from the observation wells WCC-11S and WCC-12S were also analyzed for VOCs by EPA Method 624. Full laboratory analytical reports are presented in Appendix C. The soil analytical results, summarized in Table 1, indicate low concentrations of trichloroethylene (TCE) in the soil samples at the water table. No other VOCs as necessary by EPA Method 8240 were detected in the soil samples.

A trip blank and three groundwater samples collected from the observation wells were analyzed for VOCs by EPA Method 624. One sample (WCC-11S-1B) was collected from observation well WCC-11S and two water samples (WCC-12S-1B and WCC-12S-1C) were collected from observation well WCC-12S. The groundwater analytical results are summarized in Table 2. Several chlorinated hydrocarbons were detected in the water samples, with trichloroethylene and 1,1-dichloroethene present at the highest concentrations.

4.0
CONCLUSION

The analytical results indicate that the southern and western extent of the plume has not been completely delineated, but the northern and eastern extent of the plume has been roughly defined.

APPENDIX A

FIELD PROCEDURES

Soil Sampling Protocol

Borings were advanced using a CME-75 with a 10-inch outside diameter hollow stem auger. Soil samples were collected at 5-foot intervals. When the desired depth was reached, the rods were retrieved and a soil sample was obtained with a modified California sampler. Samples were advanced 18 inches by repeated drop of a 140 pound hammer. Blow-counts were recorded. The samplers were decontaminated, after collection of each sample as follows:

- Brush-assisted water rinse to remove soil and mud
- Brush-assisted water wash with Liquinox
- Deionized water rinse to remove Liquinox
- Second deionized water rinse
- Drying with paper towels.

Sample collection and lithologic description utilized soil contained within four 4-inch brass tubes held within the modified California sampler. The third tube was capped immediately and preserved on ice for shipment to the laboratory. Samples from the upper and lower rings were utilized for lithologic description and headspace analysis. One of the brass tubes was emptied into a zip-loc bag and analyzed for headspace and screened with an OVA.

A.2 WELL INSTALLATION AND SAMPLING

Observation wells were installed upon completion of the soil boring using the drill rig equipped with the hollow-stem augers. The augers were steam cleaned prior to use at the site. The geologist on site recorded soil characteristics, sample locations, and drilling information on boring logs.

Observation wells were constructed of Schedule 40 PVC 4-inch outside diameter screen and blank casing. A 30-foot screen extended from the bottom of the boring (approximately 90 feet) to approximately 60 feet below ground surface and had a slot

Sample Containers and Sample Preservation

The samples collected during this investigation were submitted for the analysis of chemical parameters identified in Section 3.0. Soil samples were collected in 4-inch brass sample tubes and preserved on ice immediately after collection and during shipment.

Groundwater samples were collected in 40-mil VOA vials and preserved on ice. Care will be taken to see that no air bubbles are present in each sample bottle. The VOA bottles were obtained from a State-certified laboratory.

Sample Packing and Shipment Procedures

Following the sampling, the exterior of all sample rings and bottles were initially decontaminated near the sampling location by wiping the outer surface with a moist cloth. The filled sample sleeves and bottles were not sprayed with water during decontamination as this water may compromise sample integrity. In preparation for shipment, all samples were packaged in accordance with the following procedures:

- Checked to make sure sleeve cap was securely tightened.
- Checked to make sure that the sample numbers were legible using waterproof ink, and that sample labels were securely attached to the sample containers. Placed each container in a Zip-loc bag or equivalent.
- Samples were placed in a cooler lined with two inches of vermiculite or equivalent non- combustible absorbent material. Additional space in the cooler was filled with additional packing material, ensuring that the samples were separated.
- Chain-of-custody forms were placed in a Zip-loc type bag and taped to the inside of cooler lid. A chain-of-custody form accompanied samples at all times.
- The cooler lid was closed and sealed with duct tape. The cooler drain port was sealed shut with tape.

The original record accompanied the shipment, and additional copies were retained by the sampler to be returned to the project manager project files.

APPENDIX B

BORING LOGS AND SIEVE ANALYSIS

DEPTH, feet	DESCRIPTION	LITHOLOGIC LOG	WELL COMPLETION LOG	SAMPLES Number	Type	Blow Count	OVA (ppm) Head-space	OVA (ppm) Back-ground	DRILLING RATE (time)	REMARKS
	Medium dense, moist, dark olive brown, SANDY SILT (ML), micaceous (continued).									
35				7		28	32	30	1118	
40	With some CLAY.			8		15	50	30	1140	
	Medium dense, moist, dark yellowish brown, fine- to medium-grained SAND (SP).									
45				9		21	50	30	1150	
50	Dense, very moist, olive brown, SILTY fine-grained SAND (SM).			10		36	61	31	1211	
	Lens of dense, moist, gray GRAVEL (GP), rounded, 1-inch size.									Slight rig chatter.
55	Very stiff, very moist, olive, CLAYEY SILT (MH), micaceous, with iron oxide staining.			11		26	62	31	1217	
	Dense, moist, olive brown, SILTY fine-grained SAND (SM).									
60	Becomes less SILTY, grading to SAND (SP).			12		33	43	30	1236	
	Becomes more SILTY, micaceous.									
65				13		50	52	30	1248.	
	Becomes wet, dark olive gray, fine-grained SAND with SILT (SP-SM), very micaceous.									
70				14		44	56	31	1257	

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LOG OF BORING WCC-11

Figure 1
2 of 3

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BORING LOCATION	See Location Map			ELEVATION AND DATUM	Not Available
DRILLING AGENCY	A & R Drilling, Inc.	DRILLER	S. Koster	DATE STARTED	9/17/90
DATE FINISHED	9/17/90				
DRILLING EQUIPMENT	CME 75 HT, with 11-inch-O.D. Hollow-Stem Auger			TOTAL DEPTH DRILLED (ft)	91.5
ROCK DEPTH (ft)	–				
TYPE OF WELL CASING	Schedule 40 PVC	SCREEN PERFORATION	0.010"	DIAMETER OF BORING (in.)	11
DIAMETER OF WELL (in.)	4				
TYPE SIZE OF SAND PACK	0/30 Monterey Sand	TYPE THICKNESS OF SEAL(S)	Bentonite pellets (3/8") from 55' to 52.5'; bentonite cement grout from 52.5' to surface		
NUMBER OF SAMPLES	DISTURBED: 0	UNDISTURBED	18	CORE: 0	LOGGED BY H. Reyes
WATER DEPTH (ft)	FIRST 69.4	COMPLETION: 66.5	24 HOURS: –		CHECKED BY M. Razmdjoo

DEPTH, feet	DESCRIPTION	LITHOLOGIC LOG	WELL COMPLETION LOG	SAMPLES Number	Type	Blow Count	OVA (ppm) Head-space	OVA (ppm) Back-ground	DRILLING RATE (time)	REMARKS
	← 6 inches asphalt concrete.								0845	
	Moist, dark yellowish brown, SANDY CLAY, with fine GRAVEL [Fill].									
	Medium dense, moist, dark yellowish brown, SILTY fine-grained SAND (SM).									
5				1		24	22	8	0852	
	With trace CLAY.									
10				2		15	28	8	0859	
	Medium dense, moist, olive brown, SANDY SILT (ML) to SILTY SAND (SM).									
15				3		18	34	9	0908	
20	Becomes moist to very moist.			4		25	34	9	0915	
	Very stiff, moist, olive brown, SANDY CLAY (CL).									
25				5		23	30	9	0923	
	Dense, moist, olive brown, fine-grained SAND with SILT (SP-SM).									
30				6		34	36	10	0935	

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LOG OF BORING WCC-12

Figure 2
1 of 3

3-11-92 ZWLOG DAT.CO

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DEPTH, feet	DESCRIPTION	LITHOLOGIC LOG	WELL COMPLETION LOG	SAMPLES Number	SAMPLES Type	SAMPLES Blow Count	OVA (ppm) Head-space	OVA (ppm) Back-ground	DRILLING RATE (time)	REMARKS
	Dense, wet, olive, SILTY fine-grained SAND (SM) (continued)									
	Very dense, wet, dark yellowish brown, medium-grained SAND (SP).									
75				15		64	90	17	1157	
	Very dense, wet, olive, SILTY fine-grained SAND (SM).									
80				16		63	64	19	1218	
	Very dense, wet, olive gray, medium-grained SAND with SILT (SP-SM).									
85				17		54	66	22	1233	
	Dense, wet, olive brown, CLAYEY fine-grained SAND (SC), with abundant shell fragments.									
90				18		35	58	22	1300	
	Bottom of boring at 91.5 feet.									
95										
100										
105										

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LOG OF BORING WCC-12

Figure 2
3 of 3

3-11-92 2WLOG DACCO

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APPENDIX C

ANALYTICAL RESULTS AND CHAIN-OF-CUSTODY FORMS

CLIENT: WOODWARD CLYDE CONSULTANTS SAMPLE: TRIP BLANK
WCAS JOB #: 16763

DATE RECEIVED: 10/04/90 RUN NUMBER: 16763V1
DATE EXTRACTED: 10/10/90 SAMPLE AMOUNT: 5ML
DATE ANALYZED: 10/10/90 MATRIX: WATER

VOLATILE ORGANICS (EPA 624/8240) UNITS: UG/L (PPB)

CAS #	COMPOUND	CONCENTRATION	DET LIMIT
67-64-1	ACETONE	7.	5.
71-43-2	BENZENE	ND	1.
75-27-2	BROMODICHLOROMETHANE	ND	1.
75-25-2	BROMOFORM	ND	1.
74-83-9	BROMOMETHANE	ND	5.
78-93-3	2-BUTANONE (MEK)	ND	5.
75-15-0	CARBON DISULFIDE	ND	1.
56-23-5	CARBON TETRACHLORIDE	ND	1.
108-90-7	CHLOROBENZENE	ND	1.
75-00-3	CHLOROETHANE	ND	5.
110-75-8	2-CHLOROETHYLVINYL ETHER	ND	10.
67-66-3	CHLOROFORM	ND	1.
74-87-3	CHLOROMETHANE	ND	5.
108-41-8	CHLOROTOLUENE	ND	1.
124-48-1	DIBROMOCHLOROMETHANE	ND	1.
95-50-1	1,2-DICHLOROBENZENE	ND	1.
541-73-1	1,3-DICHLOROBENZENE	ND	1.
106-46-7	1,4-DICHLOROBENZENE	ND	1.
75-34-3	1,1-DICHLOROETHANE	ND	1.
107-06-2	1,2-DICHLOROETHANE	ND	1.
75-35-4	1,1-DICHLOROETHYLENE	ND	1.
156-59-4	CIS-1,2-DICHLOROETHYLENE	ND	1.
156-60-5	TRANS-1,2-DICHLOROETHYLENE	ND	1.
78-87-5	1,2-DICHLOROPROPANE	ND	1.
10061-01-5	CIS-1,3-DICHLOROPROPENE	ND	1.
10061-02-6	TRANS-1,3-DICHLOROPROPENE	ND	1.
100-41-4	ETHYLBENZENE	ND	1.
106-93-4	ETHYLENE DIBROMIDE	ND	1.
76-13-1	FREON-TF	ND	1.
119-78-6	2-HEXANONE	ND	5.
75-09-2	METHYLENE CHLORIDE	ND	5.
108-10-1	4-METHYL-2-PENTANONE (MIBK)	ND	5.
100-42-5	STYRENE	ND	1.
79-34-5	1,1,2,2-TETRACHLOROETHANE	ND	1.
127-18-4	TETRACHLOROETHYLENE	ND	1.
109-99-9	TETRAHYDROFURAN	ND	5.
108-88-3	TOLUENE	ND	1.
71-55-6	1,1,1-TRICHLOROETHANE	ND	1.
79-00-5	1,1,2-TRICHLOROETHANE	ND	1.
79-01-6	TRICHLOROETHYLENE	ND	1.
75-69-4	TRICHLOROFLUOROMETHANE	ND	1.
108-05-4	VINYL ACETATE	ND	5.
75-01-4	VINYL CHLORIDE	ND	5.
95-47-6	TOTAL XYLENES	ND	1.

CLIENT: WOODWARD CLYDE CONSULTANTS SAMPLE: WCC-11S-1B
WCAS JOB #: 16763

DATE RECEIVED: 10/04/90 RUN NUMBER: 16763V2
DATE EXTRACTED: 10/10/90 SAMPLE AMOUNT: 5ML
DATE ANALYZED: 10/10/90 MATRIX: WATER

VOLATILE ORGANICS (EPA 624/8240) UNITS: UG/L (PPB)

CAS #	COMPOUND	CONCENTRATION	DET LIMIT
67-64-1	ACETONE	ND	5.
71-43-2	BENZENE	ND	1.
75-27-2	BROMODICHLOROMETHANE	ND	1.
75-25-2	BROMOFORM	ND	1.
74-83-9	BROMOMETHANE	ND	5.
78-93-3	2-BUTANONE (MEK)	ND	5.
75-15-0	CARBON DISULFIDE	ND	1.
56-23-5	CARBON TETRACHLORIDE	ND	1.
108-90-7	CHLOROBENZENE	ND	1.
75-00-3	CHLOROETHANE	ND	5.
110-75-8	2-CHLOROETHYLVINYL ETHER	ND	10.
67-66-3	CHLOROFORM	ND	1.
74-87-3	CHLOROMETHANE	ND	5.
108-41-8	CHLOROTOLUENE	ND	1.
124-48-1	DIBROMOCHLOROMETHANE	ND	1.
95-50-1	1,2-DICHLOROBENZENE	ND	1.
541-73-1	1,3-DICHLOROBENZENE	ND	1.
106-46-7	1,4-DICHLOROBENZENE	ND	1.
75-34-3	1,1-DICHLOROETHANE	ND	1.
107-06-2	1,2-DICHLOROETHANE	ND	1.
75-35-4	1,1-DICHLOROETHYLENE	3.	1.
156-59-4	CIS-1,2-DICHLOROETHYLENE	1.	1.
156-60-5	TRANS-1,2-DICHLOROETHYLENE	ND	1.
78-87-5	1,2-DICHLOROPROPANE	ND	1.
10061-01-5	CIS-1,3-DICHLOROPROPENE	ND	1.
10061-02-6	TRANS-1,3-DICHLOROPROPENE	ND	1.
100-41-4	ETHYLBENZENE	ND	1.
106-93-4	ETHYLENE DIBROMIDE	ND	1.
76-13-1	FREON-TF	ND	1.
119-78-6	2-HEXANONE	ND	5.
75-09-2	METHYLENE CHLORIDE	ND	5.
108-10-1	4-METHYL-2-PENTANONE (MIBK)	ND	5.
100-42-5	STYRENE	ND	1.
79-34-5	1,1,2,2-TETRACHLOROETHANE	ND	1.
127-18-4	TETRACHLOROETHYLENE	ND	1.
109-99-9	TETRAHYDROFURAN	ND	5.
108-88-3	TOLUENE	ND	1.
71-55-6	1,1,1-TRICHLOROETHANE	ND	1.
79-00-5	1,1,2-TRICHLOROETHANE	ND	1.
79-01-6	TRICHLOROETHYLENE	21.	1.
75-69-4	TRICHLOROFLUOROMETHANE	ND	1.
108-05-4	VINYL ACETATE	ND	5.
75-01-4	VINYL CHLORIDE	ND	5.
95-47-6	TOTAL XYLENES	ND	1.

CLIENT: WOODWARD CLYDE CONSULTANTS SAMPLE: WCC-12S-1B
WCAS JOB #: 16763

DATE RECEIVED: 10/04/90 RUN NUMBER: 16763V3
DATE EXTRACTED: 10/10/90 SAMPLE AMOUNT: 5ML
DATE ANALYZED: 10/10/90 MATRIX: WATER

VOLATILE ORGANICS (EPA 624/8240) UNITS: UG/L (PPB)

CAS #	COMPOUND	CONCENTRATION	DET LIMIT
67-64-1	ACETONE	ND	5.
71-43-2	BENZENE	5.	1.
75-27-2	BROMODICHLOROMETHANE	ND	1.
75-25-2	BROMOFORM	ND	1.
74-83-9	BROMOMETHANE	ND	5.
78-93-3	2-BUTANONE (MEK)	ND	5.
75-15-0	CARBON DISULFIDE	ND	1.
56-23-5	CARBON TETRACHLORIDE	ND	1.
108-90-7	CHLOROBENZENE	ND	1.
75-00-3	CHLOROETHANE	ND	5.
110-75-8	2-CHLOROETHYLVINYL ETHER	ND	10.
67-66-3	CHLOROFORM	8.	1.
74-87-3	CHLOROMETHANE	ND	5.
108-41-8	CHLOROTOLUENE	ND	1.
124-48-1	DIBROMOCHLOROMETHANE	ND	1.
95-50-1	1,2-DICHLOROBENZENE	ND	1.
541-73-1	1,3-DICHLOROBENZENE	ND	1.
106-46-7	1,4-DICHLOROBENZENE	ND	1.
75-34-3	1,1-DICHLOROETHANE	15.	1.
107-06-2	1,2-DICHLOROETHANE	3.	1.
75-35-4	1,1-DICHLOROETHYLENE	1100.	1.
156-59-4	CIS-1,2-DICHLOROETHYLENE	36.	1.
156-60-5	TRANS-1,2-DICHLOROETHYLENE	15.	1.
78-87-5	1,2-DICHLOROPROPANE	ND	1.
10061-01-5	CIS-1,3-DICHLOROPROPENE	ND	1.
10061-02-6	TRANS-1,3-DICHLOROPROPENE	ND	1.
100-41-4	ETHYLBENZENE	ND	1.
106-93-4	ETHYLENE DIBROMIDE	ND	1.
76-13-1	FREON-TF	ND	1.
119-78-6	2-HEXANONE	ND	5.
75-09-2	METHYLENE CHLORIDE	ND	5.
108-10-1	4-METHYL-2-PENTANONE (MIBK)	ND	5.
100-42-5	STYRENE	ND	1.
79-34-5	1,1,2,2-TETRACHLOROETHANE	ND	1.
127-18-4	TETRACHLOROETHYLENE	ND	1.
109-99-9	TETRAHYDROFURAN	ND	5.
108-88-3	TOLUENE	ND	1.
71-55-6	1,1,1-TRICHLOROETHANE	86.	1.
79-00-5	1,1,2-TRICHLOROETHANE	4.	1.
79-01-6	TRICHLOROETHYLENE	1700.	1.
75-69-4	TRICHLOROFLUOROMETHANE	ND	1.
108-05-4	VINYL ACETATE	ND	5.
75-01-4	VINYL CHLORIDE	ND	5.
95-47-6	TOTAL XYLENES	ND	1.

CLIENT: WOODWARD CLYDE CONSULTANTS SAMPLE: WCC-12S-1C
WCAS JOB #: 16763

DATE RECEIVED: 10/04/90 RUN NUMBER: 16763V4
DATE EXTRACTED: 10/10/90 SAMPLE AMOUNT: 5ML
DATE ANALYZED: 10/10/90 MATRIX: WATER

VOLATILE ORGANICS (EPA 624/8240) UNITS: UG/L (PPB)

CAS #	COMPOUND	CONCENTRATION	DET LIMIT
67-64-1	ACETONE	ND	5.
71-43-2	BENZENE	4.	1.
75-27-2	BROMODICHLOROMETHANE	ND	1.
75-25-2	BROMOFORM	ND	1.
74-83-9	BROMOMETHANE	ND	5.
78-93-3	2-BUTANONE (MEK)	ND	5.
75-15-0	CARBON DISULFIDE	ND	1.
56-23-5	CARBON TETRACHLORIDE	ND	1.
108-90-7	CHLOROBENZENE	ND	1.
75-00-3	CHLOROETHANE	ND	5.
110-75-8	2-CHLOROETHYLVINYL ETHER	ND	10.
67-66-3	CHLOROFORM	7.	1.
74-87-3	CHLOROMETHANE	ND	5.
108-41-8	CHLOROTOLUENE	ND	1.
124-48-1	DIBROMOCHLOROMETHANE	ND	1.
95-50-1	1,2-DICHLOROBENZENE	ND	1.
541-73-1	1,3-DICHLOROBENZENE	ND	1.
106-46-7	1,4-DICHLOROBENZENE	ND	1.
75-34-3	1,1-DICHLOROETHANE	12.	1.
107-06-2	1,2-DICHLOROETHANE	3.	1.
75-35-4	1,1-DICHLOROETHYLENE	930.	1.
156-59-4	CIS-1,2-DICHLOROETHYLENE	31.	1.
156-60-5	TRANS-1,2-DICHLOROETHYLENE	13.	1.
78-87-5	1,2-DICHLOROPROPANE	ND	1.
10061-01-5	CIS-1,3-DICHLOROPROPENE	ND	1.
10061-02-6	TRANS-1,3-DICHLOROPROPENE	ND	1.
100-41-4	ETHYLBENZENE	ND	1.
106-93-4	ETHYLENE DIBROMIDE	ND	1.
76-13-1	FREON-TF	ND	1.
119-78-6	2-HEXANONE	ND	5.
75-09-2	METHYLENE CHLORIDE	ND	5.
108-10-1	4-METHYL-2-PENTANONE (MIBK)	ND	5.
100-42-5	STYRENE	ND	1.
79-34-5	1,1,2,2-TETRACHLOROETHANE	ND	1.
127-18-4	TETRACHLOROETHYLENE	ND	1.
109-99-9	TETRAHYDROFURAN	ND	5.
108-88-3	TOLUENE	ND	1.
71-55-6	1,1,1-TRICHLOROETHANE	73.	1.
79-00-5	1,1,2-TRICHLOROETHANE	4.	1.
79-01-6	TRICHLOROETHYLENE	1500.	1.
75-69-4	TRICHLOROFLUOROMETHANE	ND	1.
108-05-4	VINYL ACETATE	ND	5.
75-01-4	VINYL CHLORIDE	ND	5.
95-47-6	TOTAL XYLENES	ND	1.

CLIENT: WOODWARD CLYDE CONSULTANTS SAMPLE: LAB BLANK
WCAS JOB #: 16763

DATE RECEIVED: 10/04/90 RUN NUMBER: VBLK571
DATE EXTRACTED: 10/10/90 SAMPLE AMOUNT: 5ML
DATE ANALYZED: 10/10/90 MATRIX: WATER

VOLATILE ORGANICS (EPA 624/8240) UNITS: UG/L (PPB)

CAS #	COMPOUND	CONCENTRATION	DET LIMIT
67-64-1	ACETONE	ND	5.
71-43-2	BENZENE	ND	1.
75-27-2	BROMODICHLOROMETHANE	ND	1.
75-25-2	BROMOFORM	ND	1.
74-83-9	BROMOMETHANE	ND	5.
78-93-3	2-BUTANONE (MEK)	ND	5.
75-15-0	CARBON DISULFIDE	ND	1.
56-23-5	CARBON TETRACHLORIDE	ND	1.
108-90-7	CHLOROBENZENE	ND	1.
75-00-3	CHLOROETHANE	ND	5.
110-75-8	2-CHLOROETHYLVINYL ETHER	ND	10.
67-66-3	CHLOROFORM	ND	1.
74-87-3	CHLOROMETHANE	ND	5.
108-41-8	CHLOROTOLUENE	ND	1.
124-48-1	DIBROMOCHLOROMETHANE	ND	1.
95-50-1	1,2-DICHLOROBENZENE	ND	1.
541-73-1	1,3-DICHLOROBENZENE	ND	1.
106-46-7	1,4-DICHLOROBENZENE	ND	1.
75-34-3	1,1-DICHLOROETHANE	ND	1.
107-06-2	1,2-DICHLOROETHANE	ND	1.
75-35-4	1,1-DICHLOROETHYLENE	ND	1.
156-59-4	CIS-1,2-DICHLOROETHYLENE	ND	1.
156-60-5	TRANS-1,2-DICHLOROETHYLENE	ND	1.
78-87-5	1,2-DICHLOROPROPANE	ND	1.
10061-01-5	CIS-1,3-DICHLOROPROPENE	ND	1.
10061-02-6	TRANS-1,3-DICHLOROPROPENE	ND	1.
100-41-4	ETHYLBENZENE	ND	1.
106-93-4	ETHYLENE DIBROMIDE	ND	1.
76-13-1	FREON-TF	ND	1.
119-78-6	2-HEXANONE	ND	5.
75-09-2	METHYLENE CHLORIDE	ND	5.
108-10-1	4-METHYL-2-PENTANONE (MIBK)	ND	5.
100-42-5	STYRENE	ND	1.
79-34-5	1,1,2,2-TETRACHLOROETHANE	ND	1.
127-18-4	TETRACHLOROETHYLENE	ND	1.
109-99-9	TETRAHYDROFURAN	ND	5.
108-88-3	TOLUENE	ND	1.
71-55-6	1,1,1-TRICHLOROETHANE	ND	1.
79-00-5	1,1,2-TRICHLOROETHANE	ND	1.
79-01-6	TRICHLOROETHYLENE	ND	1.
75-69-4	TRICHLOROFLUOROMETHANE	ND	1.
108-05-4	VINYL ACETATE	ND	5.
75-01-4	VINYL CHLORIDE	ND	5.
95-47-6	TOTAL XYLENES	ND	1.

CLIENT: WOODWARD CLYDE CONSULTANTS SAMPLE: LAB BLANK
WCAS JOB #: 16763

DATE RECEIVED: 10/04/90 RUN NUMBER: VBLK572
DATE EXTRACTED: 10/11/90 SAMPLE AMOUNT: 5ML
DATE ANALYZED: 10/11/90 MATRIX: WATER

VOLATILE ORGANICS (EPA 624/8240) UNITS: UG/L (PPB)

CAS #	COMPOUND	CONCENTRATION	DET LIMIT
67-64-1	ACETONE	ND	5.
71-43-2	BENZENE	ND	1.
75-27-2	BROMODICHLOROMETHANE	ND	1.
75-25-2	BROMOFORM	ND	1.
74-83-9	BROMOMETHANE	ND	5.
78-93-3	2-BUTANONE (MEK)	ND	5.
75-15-0	CARBON DISULFIDE	ND	1.
56-23-5	CARBON TETRACHLORIDE	ND	1.
108-90-7	CHLOROBENZENE	ND	1.
75-00-3	CHLOROETHANE	ND	5.
110-75-8	2-CHLOROETHYLVINYL ETHER	ND	10.
67-66-3	CHLOROFORM	ND	1.
74-87-3	CHLOROMETHANE	ND	5.
108-41-8	CHLOROTOLUENE	ND	1.
124-48-1	DIBROMOCHLOROMETHANE	ND	1.
95-50-1	1,2-DICHLOROBENZENE	ND	1.
541-73-1	1,3-DICHLOROBENZENE	ND	1.
106-46-7	1,4-DICHLOROBENZENE	ND	1.
75-34-3	1,1-DICHLOROETHANE	ND	1.
107-06-2	1,2-DICHLOROETHANE	ND	1.
75-35-4	1,1-DICHLOROETHYLENE	ND	1.
156-59-4	CIS-1,2-DICHLOROETHYLENE	ND	1.
156-60-5	TRANS-1,2-DICHLOROETHYLENE	ND	1.
78-87-5	1,2-DICHLOROPROPANE	ND	1.
10061-01-5	CIS-1,3-DICHLOROPROPENE	ND	1.
10061-02-6	TRANS-1,3-DICHLOROPROPENE	ND	1.
100-41-4	ETHYLBENZENE	ND	1.
106-93-4	ETHYLENE DIBROMIDE	ND	1.
76-13-1	FREON-TF	ND	1.
119-78-6	2-HEXANONE	ND	5.
75-09-2	METHYLENE CHLORIDE	ND	5.
108-10-1	4-METHYL-2-PENTANONE (MIBK)	ND	5.
100-42-5	STYRENE	ND	1.
79-34-5	1,1,2,2-TETRACHLOROETHANE	ND	1.
127-18-4	TETRACHLOROETHYLENE	ND	1.
109-99-9	TETRAHYDROFURAN	ND	5.
108-88-3	TOLUENE	ND	1.
71-55-6	1,1,1-TRICHLOROETHANE	ND	1.
79-00-5	1,1,2-TRICHLOROETHANE	ND	1.
79-01-6	TRICHLOROETHYLENE	ND	1.
75-69-4	TRICHLOROFLUOROMETHANE	ND	1.
108-05-4	VINYL ACETATE	ND	5.
75-01-4	VINYL CHLORIDE	ND	5.
95-47-6	TOTAL XYLENES	ND	1.

VOLATILE SURROGATE PERCENT RECOVERY SUMMARY

INSTRUMENT : TRIO1
DATE ANALYZED: 10/10/90

FILENAME	SAMPLE ID	W/S	1,2-DICHLORO-ETHANE-d4	TOLUENE-d8	BFB
16763V1	TRIP BLANK	W	108	89	91
16763V2	WCC-11S-1B	W	109	90	89
16763V3	WCC-12S-1B	W	110	90	91
16763V4	WCC-12S-1C	W	109	90	93
VBLK571	LAB BLANK	W	108	96	96

S - SOIL W - WATER

INSTRUMENT : TRIO1
DATE ANALYZED: 10/11/90

FILENAME	SAMPLE ID	W/S	1,2-DICHLORO-ETHANE-d4	TOLUENE-d8	BFB
16763V5	WCC-12S-1B	W	111	96	96
16763V6	WCC-12S-1C	W	111	97	96
VBLK572	LAB BLANK	W	111	95	95

S - SOIL W - WATER

September 25, 1990

RECEIVED
SEP 2 6 1990
WCC-SANTA ANA

WEST COAST ANALYTICAL SERVICE, INC.
ANALYTICAL CHEMISTS

WOODWARD-CLYDE CONSULTANTS
203 N. Golden Circle Dr.
Santa Ana, CA 92705

Attn: Dr. Alistaire Callender

JOB NO. 16636

A

LABORATORY REPORT

Samples Received: Thirty-four (34) Soil Samples
Date Received: 9-17-90
Date Released for Analysis: 9-21-90
Purchase Order No: Proj#: 8941863J Task II/Douglas Aircraft

The samples were analyzed as follows:

Samples Analyzed	Analysis	Results
Three (3) soils	Volatile Organics by EPA 8240	Data Sheets

B. Michael Hovanec
Senior Staff Chemist

D. J. Northington, Ph.D.
President

9840 Alburtis Avenue • Santa Fe Springs, California 90670 • 213/948-2225 • FAX 213/948-5850

TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT: WOODWARD CLYDE CONSULTANTS SAMPLE: WCC-11-14-3
WCAS JOB #: 16636

UNITS: UG/KG (PPB)

	COMPOUND NAME	FRACTION	APPROXIMATE CONCENTRATION
1	NONE FOUND	VOA	

TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT: WOODWARD CLYDE CONSULTANTS SAMPLE: WCC-12-14-3
WCAS JOB #: 16636

UNITS: UG/KG (PPB)

	COMPOUND NAME	FRACTION	APPROXIMATE CONCENTRATION
1	NONE FOUND	VOA	

TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT: WOODWARD CLYDE CONSULTANTS SAMPLE: WCC-12-15-3
WCAS JOB #: 16636

UNITS: UG/KG (PPB)

	COMPOUND NAME	FRACTION	APPROXIMATE CONCENTRATION
1	NONE FOUND	VOA	

Woodward-Clyde Consultants

SHIPMENT NO.: 1

CHAIN OF CUSTODY RECORD

PAGE 1 OF 2

DATE 2 11 71 2

PROJECT NAME: DOUGLAS AIRCRAFT CO

PROJECT NO.: 29415-A2 1

Sample Number	Location	Type of Sample		Type of Container	Type of Preservation		Analysis Required *
		Material	Method		Temp	Chemical	
WCC-11-1-3	WX-11	SOIL	DRIVE	BRASS TUBE	ICE	NONE	EXTRACT
11-2-3	1	1	1	1	1	1	ALSTAKER
11-3-3	1	1	1	1	1	1	SILLIKUDAR
11-4-3	1	1	1	1	1	1	
11-5-3	1	1	1	1	1	1	
11-6-3	1	1	1	1	1	1	
11-7-3	1	1	1	1	1	1	
11-8-3	1	1	1	1	1	1	
11-9-3	1	1	1	1	1	1	
11-10-3	1	1	1	1	1	1	
11-11-3	1	1	1	1	1	1	
11-12-3	1	1	1	1	1	1	
11-13-3	1	1	1	1	1	1	
11-14-3	1	1	1	1	1	1	
11-16-3	1	1	1	1	1	1	
11-17-3	"	"	"	"	"	"	

Total Number of Samples Shipped: 17 | Sampler's Signature: [signature]

Relinquished By: Signature [signature] Printed Name [illegible] Company [illegible] Reason [illegible]	Received By: Signature [signature] Printed Name [illegible] Company [illegible]	Date [illegible] Time [illegible]
Relinquished By: Signature [signature] Printed Name [illegible] Company [illegible] Reason	Received By: Signature [signature] Printed Name [illegible] Company [illegible] 16636	Date 4/-15 Time [illegible]
Relinquished By: Signature Printed Name Company Reason	Received By: Signature Printed Name Company	Date / / Time
Relinquished By: Signature Printed Name Company Reason	Received By: Signature Printed Name Company	Date / / Time

Special Shipment / Handling / Storage Requirements:

[illegible] WCC-11-[illegible]-3 [illegible] 7-3

* Note – This does not constitute authorization to proceed with analysis

LA/OR-0183-421

Woodward-Clyde Consultants

SHIPMENT NO.: 2

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

DATE 10/14/15

PROJECT NAME: DOUGLAS AIRCRAFT

PROJECT NO.: 294,763.1

Sample Number	Location	Type of Sample: Material	Type of Sample: Method	Type of Container	Type of Preservation: Temp	Type of Preservation: Chemical	Analysis Required*
TRIP BLANK	—	WATER	—	40 ML VOA	ICE	HCl	601/8010
WCC-L-1	WCC-L		BAIL	4 "			"
" L-2	"			" "			"
WCC-B-1	WCC-B			" "			"
" B-2	"			"			"
WCC-HS-1	WCC HS			" "			
" " -2	" "			" "			
WCC-11-1A	WCC-11			500 ML GLASS			
WCC 11-1B				4 ML GLASS			
" 11-1B				" "			
" 11-1C				" "			
" 11-1D				" "			
WCC-12-1B	WCC-12			" "			
" 12-1B				" "			
" 12-1C				" "			
" 12-1D				" "			
" 12-1A				500 ML GLASS			

Total Number of Samples Shipped: 17 | Sampler's Signature: [signature]

Relinquished By: Signature [signature] Printed Name [illegible] Company [illegible] Reason [illegible]	Received By: Signature _____ Printed Name _____ Company 16763	Date / / Time
Relinquished By: Signature _____ Printed Name _____ Company _____ Reason _____	Received By: Signature _____ Printed Name _____ Company _____	Date / / Time
Relinquished By: Signature _____ Printed Name _____ Company _____ Reason _____	Received By: Signature _____ Printed Name _____ Company _____	Date / / Time
Relinquished By: Signature _____ Printed Name _____ Company _____ Reason _____	Received By: Signature _____ Printed Name _____ Company _____	Date / / Time

Special Shipment / Handling / Storage Requirements:

* Note – This does not constitute authorization to proceed with analysis

LA.OR-0183-421